

April 15, 1955

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PROGRESS REPORT NO. 3

During the past six weeks, a very high level of activity has been reached on the project. About 85% of the fabricated sheet metal parts for all airplanes have been completed. Fuselage #1 is on schedule and will be removed from the jig on May 20th or slightly sooner, as per schedule. Airplane #2 is likewise on schedule, as is the static test fuselage.

Sealing of the leading edge, which was considered to be one of the most difficult problems on the aircraft, has proceeded in a satisfactory manner, utilizing highly skilled workmen and inspection. Several leading edges are finished to the point of being pressure tested within the next week.

Main wing structures are being assembled. Difficulty with the flap mechanism, due to inability to obtain the proper flap actuators, will necessitate building two aircraft with the only available actuators and then changing to a redesigned type. While the initial design will be satisfactory strengthwise, there will be considerable play and deflection in the flaps, particularly on the ground.

The problem of oil cooling at altitude has necessitated the use of two very large oil coolers requiring external air scoops, each having about 30 inches of inlet area to provide for heat rejection at the very low indicated air speeds involved. The heat regained from the coolers, however, will cancel the drag of the scoops. It has also been found necessary to reject part of the oil heat to the engine fuel to prevent water crystals from plugging the fuel filters at altitude.

Discussions with the fuel suppliers indicate that a fuel can be provided which will solve the boiling problem at altitude and which will be satisfactory down to a fuel temperature of -67°F . It is not expected that fuel temperatures lower than this value will be encountered by the airplane, but so little is known of the operating conditions that it is considered advisable to provide the fuel heater and not sacrifice air starting conditions in an attempt to get a fuel of lower freezing point.

Efforts are being made to accelerate the delivery of the 5th & 6th airplanes ahead of the original schedule, as requested. The new schedule has been submitted in other correspondence.

The attached statement of financial expenditures shows the current cost running under the predicted cost by about \$150,000 at the beginning of April. This is in spite of the fact that the schedule position is excellent.

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A considerable amount of activity this month has gone into investigation of base sites and requirements. The results of these studies will not be recorded herein, but are known to the responsible people on the project.

During March, General LeMay visited this contractor and was given a briefing on the aircraft and its capability. He was not shown the construction in process but he seemed to be pleased with the basic concept.

The cockpit mock-up has been completed and a scanning lense provided in place of a periscope, which solves one of the most difficult aircraft problems.

Major problems expected in the near future are:

1. Problems with the pressure suit.
2. Ability to have an operating base by July 15th of this year.
3. Ability to get underway with a program of training for the maintenance and other personnel.



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Clarence L. Johnson
Chief Engineer

CLJ:vmp

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PLANE STRUCTURAL DEMONSTRATION

SAPC 3155

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The aircraft structural strength was demonstrated during five flights of airplane #341. The tests included V-G maneuvers with flaps and ailerons faired and also with flaps and ailerons shifted to gust control; maximum speeds with flaps faired, with flaps shifted to gust control and with 30° of landing flaps; maximum speeds with landing gear and speed brakes extended; yaw with 150 pounds pedal force and aileron rolls with a 50 pound couple, 100 pound force, applied at the control wheel.

The V-G maneuvers consisted of pull-ups and push-overs to stall or limit acceleration. These maneuvers demonstrated the airplane to the limits of the allowable V-n diagram for design gross weight, Figure 1. As shown in the figure, the maximum negative G with gust control was -1.3 at 248 knots. This develops limit load in the structure, since the lower line of the figure represents one condition, i.e., limit load in the lower surface of the wing.

The maximum speeds with flaps faired and flaps shifted to gust control are also shown in Figure 1. With flaps faired the maximum speed was 237 knots, 17 knots faster than the 220 knot placard speed. With gust control the maximum speed was 269 knots, 9 knots faster than placard speed.

The speed brakes were demonstrated to a maximum speed of 269 knots. The airplane was accelerated to 264 knots with the speed brakes extended. The brakes were then retracted and extended again at 269 knots.

The airplane was demonstrated to 264 knots maximum speed with the landing gear extended and 147 knots maximum speed with 30° of landing flaps.

ATT 3.

Airlane Structural Demonstration.

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The aileron roll test was performed by starting from a 45° bank to the left and rolling into a 45° bank to the right. The maneuver was performed at 150 knots with a 50 pound couple, 100 pound force, applied at the wheel.

The yaw test was made at 253 knots. The airplane was yawed to the right while the rudder pedal force was gradually increased to a maximum of 150 pounds.

The structural demonstration tests are summarized in the following tabulations.

STRUCTURAL DEMONSTRATION SUMMARYFLAPS & AILERONS FAIRED

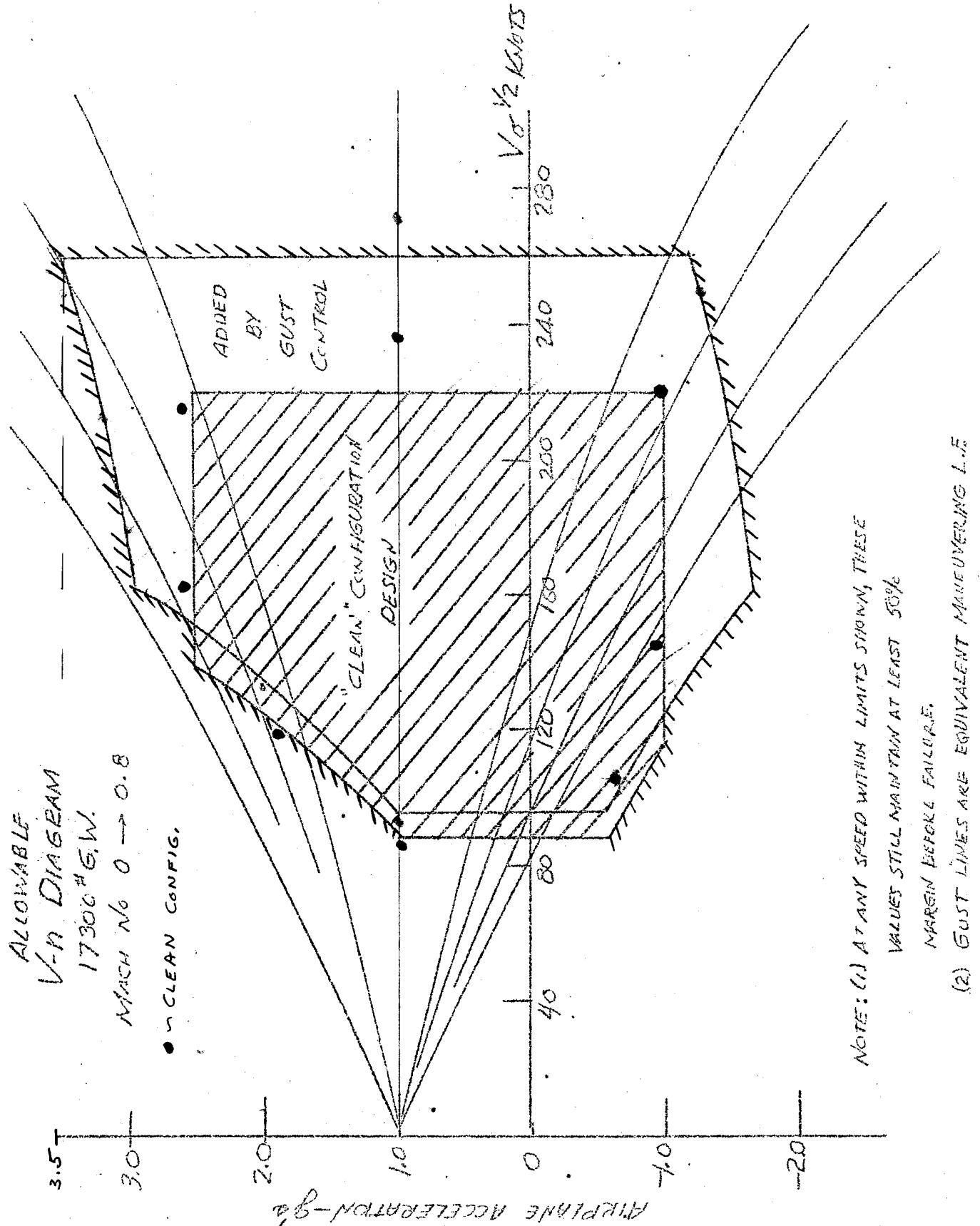
Flight	Correct IAS- Knots	G's	Maneuver
35	86	+1.0	1 G Stall.
	117	+1.86	Accelerated stall
	159	+2.6	V-g
	216	+2.6	V-g
	220	-1.0	V-g
	141	-0.9	V-g
	103	-0.6	V-g
	237	+1.0	Max. speed
41	147	+1.0	Max. speed with 30° wing flaps
47	150	+1.0	Roll with 100# wheel force

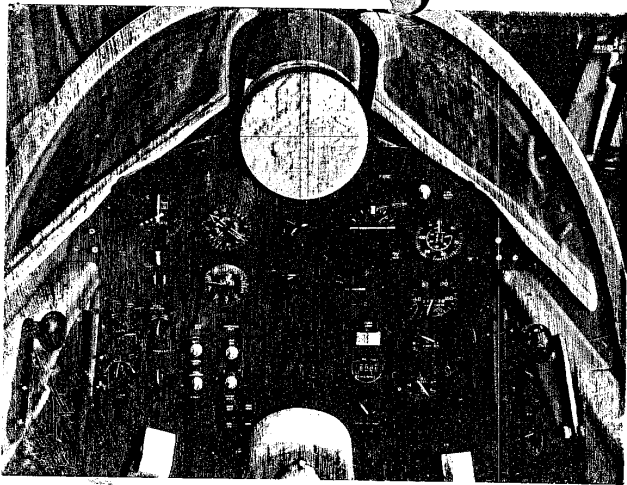
Airlane Structural Demonstration.

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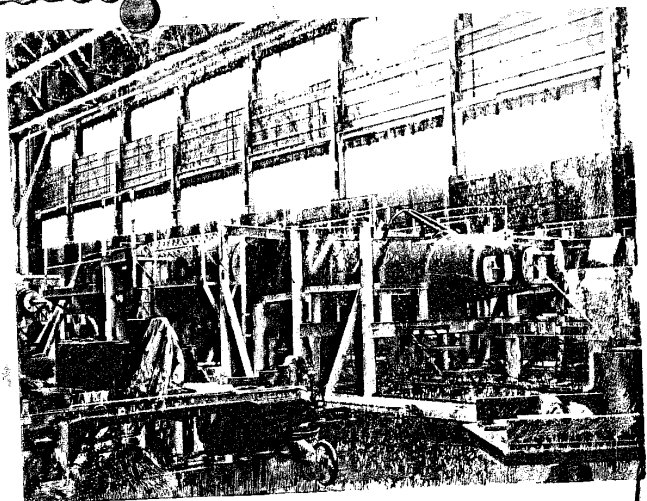
Structural Demonstration Summary (Contd.)

<u>FLAPS & AILERONS SHIFTED TO GUST CONTROL ON</u>			
<u>Flight</u>	<u>Correct IAS- Knots</u>	<u>G's</u>	<u>Maneuver</u>
37	92	1.0	1 G Stall
	130	1.92	Accelerated stall
	180	2.94	V-g
	213	3.15	V-g
	250	3.46	V-g
41	248	-1.3	V-g
	269	1.0	Max. speed with speed brakes extended
	263.5	1.0	Max. speed with landing gear down.
49	253	1.0	Yaw with 150# pedal force. Rudder angle 2.2° right.

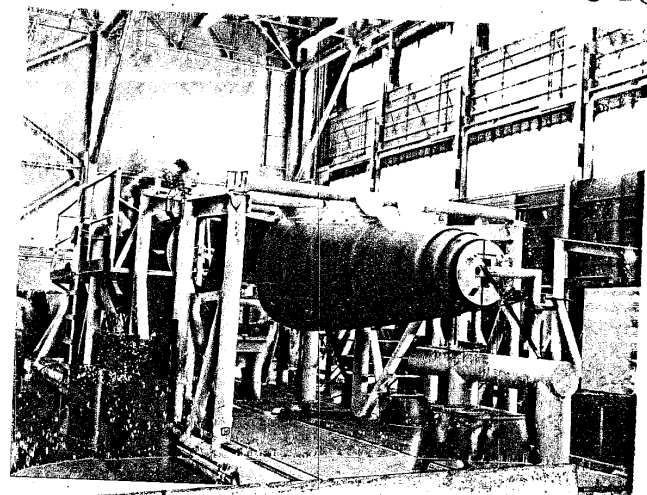




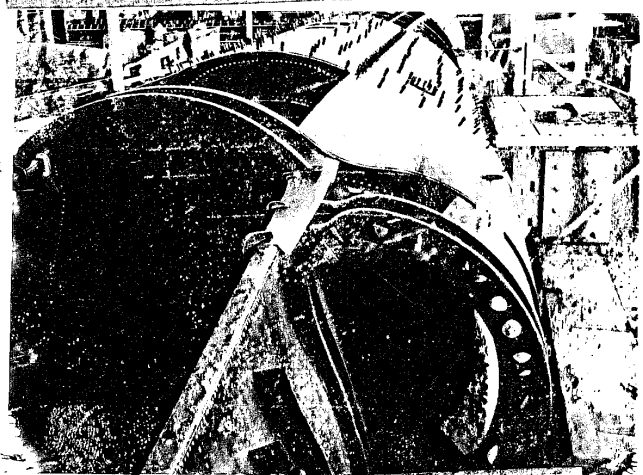
4-20-55 Cockpit Mockup



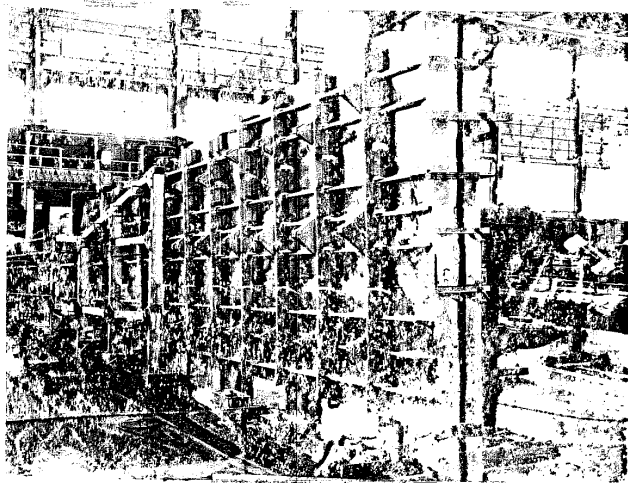
4-20-55 #1 Main Fuselage



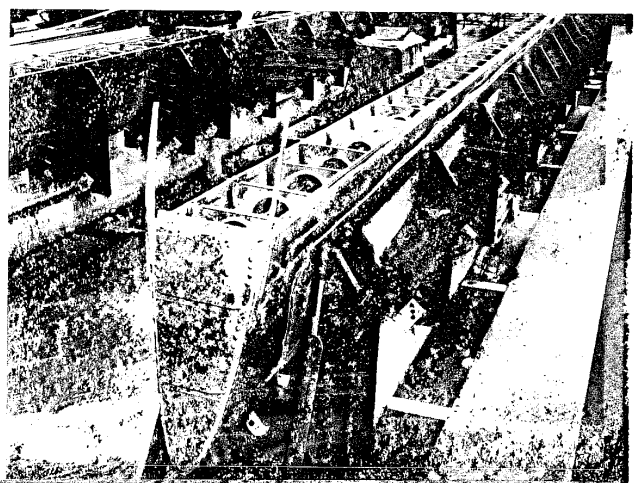
4-20-55 #4 Fwd. Fus. in Jig



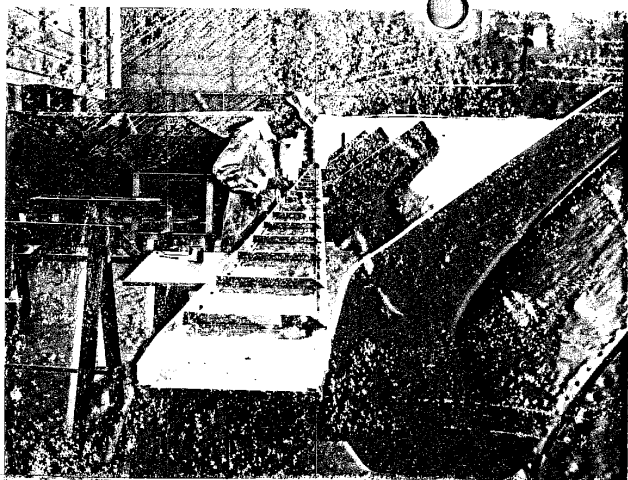
4-20-55 #1 Main Fuselage - L.H. Side
Looking Aft



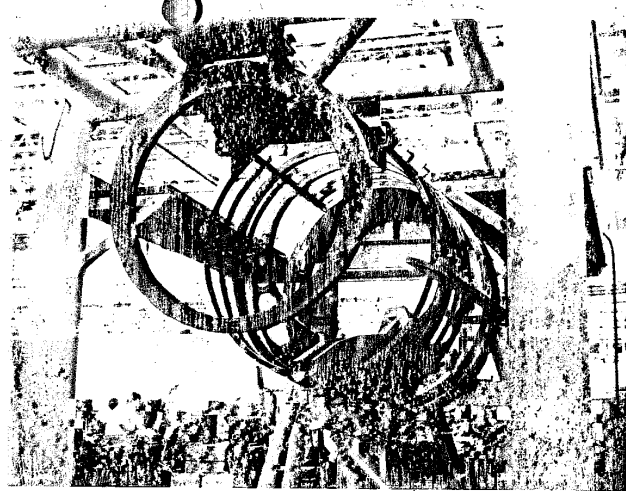
H. Wing, Leading Edge



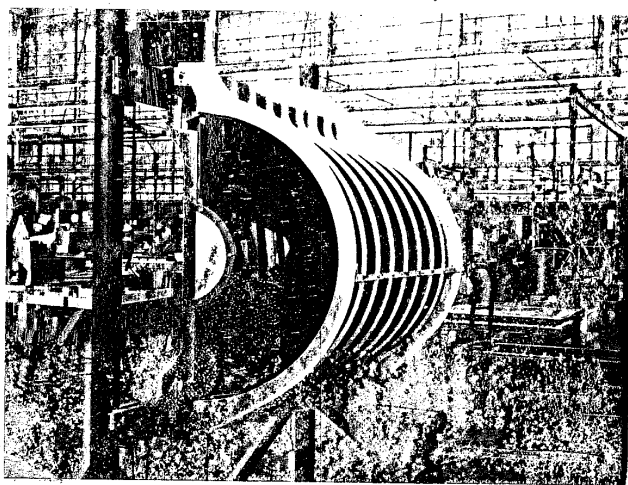
4-20-55. #1 L.H. Wing - Lower Surface



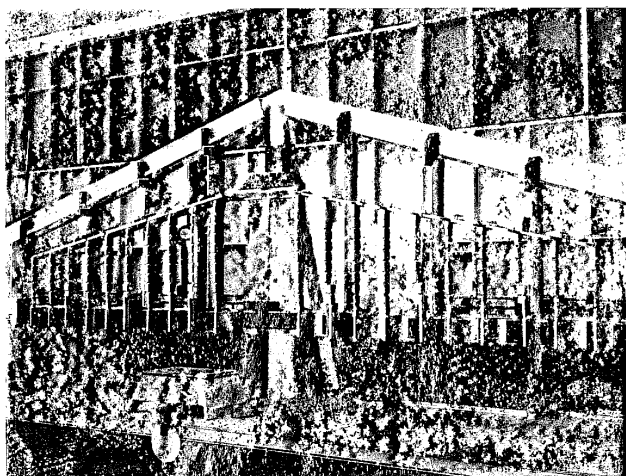
4-20-55 #1 Wing Beam (48%) in Tank Seal



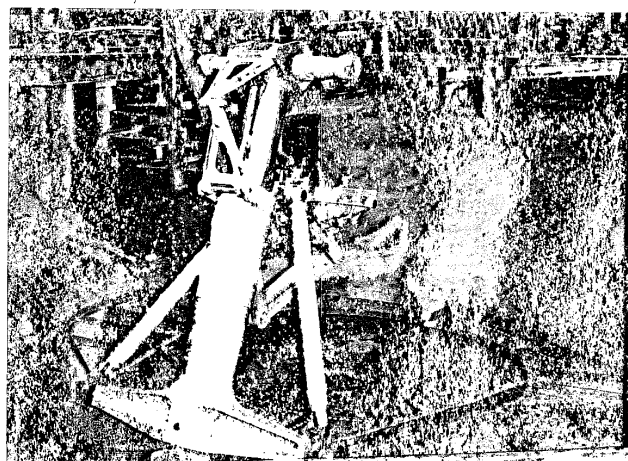
4-20-55 #1 Aft Fuselage



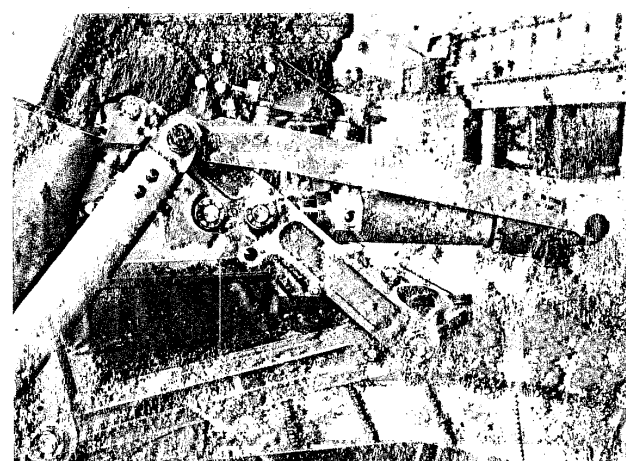
4-20-55 #1 Engine Air Duct



4-20-55 Horiz. Stabilizer Jig



4-19-55 #1 Main Ldg. Gear Fit to Trunnion
Blkd - Retracted Position



4-19-55 #1 Main Ldg. Gear Retraction
Mechanism & Uplock